

# Electronic Mail, A New Media Technology, Making Its Way from a Cubicle in Academe to the Corporate Setting

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## Introduction:

Imagine two graduate students, Lee Jones and Chris Brown, both majoring in communication at two different midwestern universities. Presently, they are co-authoring a paper for a national convention on using videotape in different organizational problem solving contexts. As Lee enters his research cubicle, he turns on his personal computer and notices that Chris has left a message. Upon checking the message Lee discovers that Chris has edited the section that he had sent her the previous day and has added an additional section for him to edit. If we extend this illustration into the future it is easy to see Lee and Chris in the positions of Director of Communication or Training in two different organizations located a continent apart. As colleagues performing similar jobs in two different organizations, they often exchange training materials, evaluation instruments, workshop ideas, and friendly messages with each other and with employees located in various parts of their own company. This illustration demonstrates how electronic mail can serve as an application for computer-assisted information flow in educational and organizational contexts.

This paper will define electronic mail, report its present status in terms of usage, explore relevant communication issues for assessing this computer-assisted technology, and infer several economic and societal implications based on these communication issues. Finally, an analysis of the discussed issues will be considered, as electronic mail gains greater acceptance.

## What is Electronic Mail?

Although electronic mail refers to any one of a number of ways to send a written message by electronic means<sup>1</sup>, the definition used here was phrased by Susen S. Kay, Senior Product Planner for AT&T Technologies of Lisie, Illinois:

...electronic mail is a system that allows a sender to enter a message/document until the receiver is ready to accept it. The receiver can generally answer, forward, file or delete the communication. This is technically called a computer-based message system.<sup>2</sup>

This definition suggests how the hypothetical co-authored paper and training materials can be transmitted via electronic mail. To clarify this communication network, Figures 1 through 4, provided by R.J. Spinrad, illustrate the operation of the electronic desk in accepting and sending electronic mail. Figure 1 represents the individual desk that Lee and Chris each have. Figures 2 and 3 refer to the connections that each have in their own organization with connections to the other employees within that network. Figure 4 indicates a method available to Lee and Chris that will connect them with individuals in other branches of their own organizations and with each other. Notice that this last communications server is linked via common carrier networks such as telephone wires or satellite, whereas the intrasite network only connects those within the organization itself. Chris and Lee could also have personal computers at home that would allow them to access electronic mail.

Although this concept of electronic mail may seem futuristic to the uninitiated, predcasts suggests that it will mushroom by the 1990's.<sup>3</sup> According to the *Christian Science Monitor*, electronic mail promises to generate over eleven billion dollars in revenue in 1995, up from 930 million in 1980.<sup>4</sup> Joe Malone, writing in *Communication News*, suggests that the use of personal computers to provide electronic mail is gaining acceptance.<sup>5</sup> According to *Infosystems*, as of June, 1984, there are over 40 vendors who offer computer-based electronic mail systems, almost double the number a year before.<sup>6</sup> In addition to the wide variety of systems and options, the market also provides over ten subscription vendors (previously called time-sharing vendors) who sell mailboxes based on usage or connect time.<sup>7</sup> There is also one vendor, Computer Corporation of America, that will sell an individual mailbox for a flat fee of \$60 a month which includes a maximum of nine connect hours and 500 stored messages.<sup>8</sup> In 1982, there were over 500,000 of these electronic mailboxes in use. The electronic mailbox is only one aspect of the marketing potential. There are also a number of software packages available to make the transfer of the message as simple as turning on the system.<sup>9</sup> The truth is that electronic mail is available and ready to alter the traditional message exchange systems used by members of academe and the business community.

## What Are the Potential Applications of Electronic Mail to Education and Business?

Many applications of electronic mail to educational and business goals exist in addition to the application illustrated in the above hypothetical example. Hiltz and Kerr reported that electronic mail in an educational setting was used to develop a network of scientists.<sup>10</sup> This network was funded by a grant from the National Science Foundation's Division of Information Science and Technology. One prominent system, the Electronic

**Information Exchange System (EIES), designed by Murray Turoff, included messages, conferences, notebooks, and a large number of special structures and advanced features.**<sup>11</sup> The University of Wisconsin financed the development of Telemail, an electronic mail system for communication among its network members. Since the **system originated in 1976, it has been used fairly steadily. During a two-week monitoring period in early 1980, the data reported 387 registered users, of whom 202 were active, and about 150 messages daily.**<sup>12</sup> Another popular application is the electronic mail system at the University of California's Division of Library Automation. This is implemented through a series of extensions to the widely-used WYLBUR text-editing system.<sup>13</sup> Other systems (COM, CONFER, PANALOG, NLS, OICS, PLANET, HUB, LEGITECH) all use electronic mail applications in more group oriented functions that would be classified as computer conferencing.<sup>14</sup> In addition to these more structured systems, individualized applications, previously called Computer-Assisted Instruction, are now using electronic mail as a teaching method. A typical example is student-teacher exchange of papers, designs, and research in an academic setting.<sup>15</sup> Particularly adaptable to leaves for consulting or research sabbaticals, the electronic mail system provides students a continuing link with their instructors who may be in the field.<sup>16</sup> The application of electronic mail to academe is rich in its promise but still in its infancy in regard to research reports.

The current academic environment, however, may not offer the number of applications that presently exist in corporate settings. Kerr and Hiltz argue that there are many commercial electronic messaging systems with no published evaluations and that many systems function within single organizations.<sup>17</sup> Existing literature mentions a few prominent examples. The Continental Bank links more than one thousand employees by electronic mail. ARPANET reports more than 5,000 use electronic messages. Texas Instrument has a worldwide network of eight thousand terminals that handle more than four million messages annually. In addition, just about every major office products company has developed or announced plans for electronic mail services, including Tymnet's OnTyme, Tenenet's Telemail, and Datapac's Envoy 100. Satellite Business Systems, Xerox and AT&T have announced the forthcoming availability of these systems. In addition, Datapoint, Wand, DEC, Prine and IBM, among others, include this capability in their newly designed and introduced "integrated office systems."<sup>18</sup> If there is presently a way that an electronic message can be used, its potential application is being tried. Forbes Magazine reported last July the transfer of a traditional telephone answering service company in Illinois to an electronic message system.<sup>19</sup> Perhaps Brian Ibsen put it best when he wrote in *The Office*:

Once a decision-maker uses electronic mail, it tends to become an imperative rather than an alternative. It is one of the main building blocks of the office of the future. As computer-based technologies spread throughout the office, electronic mail will become second nature. Just as the local network will provide the necessary physical inter-connection for the office, electronic mail will provide the human connection. Replacing and supplementing the telephone and paper mail for many office and personal communications, electronic mail will be the communication of choice when integrated communications is required.<sup>20</sup>

### **What Are the Relevant Communication Issues that Need to be Considered with the Emergence of Electronic Mail?**

Any communication exchange that is potentially as pervasive as electronic mail has relevant communication issues that one must examine as the technology receives wider acceptance. For example, traditional criteria for evaluating effective dyadic communication, such as the definition advanced by Kay, may prove to be a problem. The standard scholarly study of communication cannot describe and evaluate adequately electronic mail with a traditional dyadic model. To support this claim the 1970 work of F.E.X. Dance, when applied to the Tubbs and Moss definition of effective communication, will not work. Tubbs and Moss argue that communication is effective when the stimulus as it was initiated and intended by the source corresponds closely with the stimulus as it is perceived or responded to by the receiver.<sup>21</sup> They advance the following three criterion to evaluate the effectiveness of dyadic communication: (1) both parties are in close proximity; (2) both parties send and receive messages, and (3) messages include both verbal and nonverbal stimuli.<sup>22</sup> Electronic mail can only meet partially the three criteria. Simply put, traditional definitions advanced by communication scholars break down when applied to technologically based media. Electronic mail has, however, certain advantages that may create its own criterion. Consider the following four potential advantages of electronic mail over face-to-face message exchange. First, electronic mail is an extremely fast message sender and eliminates the problem of sender and receiver being in close proximity. As soon as the message is sent, Susen Kay argues, it can be received on the other end if the receiver is physically present and wants to receive it. Second, electronic mail promises to be cost effective. The message may be composed off-line and only accrues line charges when it is being "mailed" with the help of the modem. As such, it can prove less costly than Federal Express or the other overnight couriers. Third, the message can be edited and adapted quickly as a feedback mode if both parties are at their electronic desk at the same time. Fourth, electronic mail messages can be in the form of a written communication. Unlike the phone message or conversation which is generally considered over when both parties terminate the conversation, electronic mail can provide a written form of the message that can be read over and over. Because electronic mail does not match the criteria of effective communication advanced by traditional communication scholars it should generate some important criteria of its own. It can be argued that electronic mail promises to be fast, efficient, and cost effective when compared to the cost of travel time, and easier to document than phone conversations.

The above communication issues, when examined by traditional concepts of effective dyadic communication, do not yield understanding when applied to electronic mail. This suggests that communication scholars should reformulate their models and theories so that they can apply to the developing computer-based communication technology that is becoming an important, if not the most important form, of communication. Dance's advice given in 1967 seems apropos here, when he observed, "A communicative transaction changes in the very act of examining it. No single particular operates apart from the totality of forces at work in the event itself. Changes in any one aspect of the process invariably affect all other constituent aspects of behavior."<sup>23</sup> Indeed, the channel, message, receiver and sender and feedback mechanisms all exist with electronic mail. To gauge its effectiveness, communication scholars must refocus their models and theories if they are to be relevant and serviceable to the discipline.

### **What Potential Positive Implications Does Electronic Mail Promise to Users and Society in General?**

The benefits of electronic mail have not been strongly established by research. Its influence is argued for, however, by Kerr and Hiltz.<sup>24</sup> First, the potential for new markets as a result of computer-mediated communications systems is argued.<sup>25</sup> Electronic mail, as well as other computer-based communication systems, will create new markets for education hardware and software. They further argue that increased use can potentially shift people from urban to rural settings.<sup>26</sup> Perhaps it will not be long before more people, like the computer genius Cray, will find their way to quiet spots like Chippewa Falls, Wisconsin, where they can continue to work in their urban job because electronic mail has freed them to live where they wish. Although the potential economic loss to the metro area must be evaluated, the potential boon to smaller, revenue starved areas promises an economic counterbalancing.

In addition to new markets and the expansion of existing markets, the potential impact on productivity promises another benefit. Gerald Goldhaber reports the results of an experiment Control Data Corporation conducted with one hundred employees working at home or at satellite offices in an energy-saving, production-raising effort at telecommuting. Initial results showed that each participant reduced monthly auto driving by 500 miles for a \$90 savings and productivity increased up to 300%.<sup>27</sup> Also, electronic mail appears to be a more satisfying and meaningful exchange. Cornelius H. Sullivan, Jr., President of Information Technology Planning Corporation of Chicago puts it this way:

This flexibility and control over the pace of human correspondence leads to a more satisfactory, meaningful interchange. Not surprisingly, research has shown that the Delphi technique for achieving consensus among experts or contending parties seems to work best with the democracy, anonymity, and neutrality created by an electronic mail intermediary.<sup>28</sup>

This satisfaction with the use of electronic mail goes beyond the professional setting. Kerr and Hiltz argue that users of computer-mediated communication systems stand to improve the quality of their lives. In particular, the users expand their potential for learning throughout their lives. They can improve skills such as spelling, typing, and literacy. Users can expand their awareness of social and cultural horizons, increase the number and strength of support systems of family, friends, and professionals. They also argue that computer-assisted communication increases the degree of personal connectedness with others, in terms of expanding the status set, the number of social participations and the scope of social relationships. They claim it increases the number of contacts that can be maintained and creates the opportunity for regular connectedness with many people.<sup>29</sup> William J. Cook agrees with these claims, and expands upon them in *The Joy of Computer Communication*.<sup>30</sup> Cook suggests a number of potential applications from reducing everyday tasks such as shopping to including suggestions for improving your sex life through electronic mail dating services.<sup>31</sup>

In the final analysis, the suggested benefits are so numerous and wide-ranging that one would be remiss to accept them tentatively in the absence of extensive research. But, the few studies that have been conducted are promising.

### **What Potential Negative Impacts Does Electronic Mail Use Pose?**

Despite the promised benefits of increased markets, greater mobility, increased productivity and personal benefits of electronic mail, one wonders about the potential negative impacts that will accrue if electronic mail becomes our predominant way of exchanging messages. There are three major potential negative effects: information overload, the dichotomy between the informationally rich and informationally deprived, and legal concerns.

First, Kerr and Hiltz focus upon information overload as a potential impact of electronic mail.<sup>32</sup> What happens to the users if too many messages get stored in his/her electronic mailbox? Miller and Hawes argue that seven responses can be generated from information overload in an organizational setting.<sup>33</sup> They are: first, omission (failing to handle all the information); second, error (ignoring or failing to correct errors when made); third, queuing (letting things pile up); fourth, filtering (dealing with input in categories ranked according to a priority system); fifth, approximation (lowering standards of precision); sixth, multiple channels (delegation of information processing to others), and seventh, escape (refusal to handle the input at all).<sup>34</sup> Such responses would negatively



impact upon organizational productivity and satisfaction. Because electronic mail is fast, efficient, and capable of being monitored when the user desires, this potential threat grows with the rapid adoption of the technology.

If information overload poses a threat to the user, the threat to the non-user of electronic mail will be more destructive in the long run. Those individuals, institutions and organizations that cannot afford or are not computer literate will discover that the competitive edge will go to those who use electronic mail. An example will illustrate this threat. A small university may offer students individual attention and small classes, but if they fail to provide the equipment that graduate students like Chris and Lee possessed to co-author their paper, they may find they are as deprived as if their library holding were inadequate. The same could be true for a new stockbroker who does not possess the quick market analysis available to those in larger firms. Fortunately grant money and private sector support can help bridge the gap. Control Data Corporation has attempted to provide support services for new business ventures in some major cities.<sup>35</sup> But the dichotomy between those who have fast, efficient information retrieval and those who do not must be considered a strong economic, political and social issue that must be addressed with the increased adoption of electronic mail.

Besides the potential threats of information overload and dichotomization of society, the multifaceted issue of legal problems must be addressed. The first is the issue of system security, including the problems of royalties, patents, and copyrights. To address the first issue, one must question the security of an electronic mailbox. As System Security Technology Manager for Xerox, James A. Schweitzer suggests, the electronic workplace is not as secure as it should be.<sup>36</sup> Schweitzer argues that if information is considered to be the key resource for business in the "information age," then managers and systems users need to gain control now, before the interconnection of people via electronic information processors make action too little, too late.<sup>37</sup>

In short, the legal issue, a concern for privacy, suggests potential threats to both academe and business. What if a competitive scholar or an ambitious colleague gains access to another student or colleague's electronic mailbox and uses the information to further his/her own work or standing? Granted, such "sabotage" probably will occur infrequently, and as Schweitzer suggests, a number of methods and policies exist to protect the electronic workplace. Nevertheless, the potential negative impact needs to be addressed.

A second legal issue is the use of electronic mail to exchange copyrighted material that would otherwise be secured. This issue has already surfaced with the database industry<sup>38</sup> and it can be a problem for the creators of the pirated material rather than for the user themselves. But how secure is the exchange of material between two scholars working on a potential patent that could result in revenues from royalties? If two scientists are exchanging research that leads to the development of a patent for which only one of the scientists applies, then what are the legal implications? Can documents shared using electronic mail be admitted into court as evidence, the same way telephone records can be admitted? That question needs an answer. Reason suggests that if the material is outputted on the printer, the material may prove to be admissible as evidence. However, what if the exchanged material is simply accessed on the screen, and the receiver does not print the output? Thus the problem of determining to whom the patent claim rightfully belongs becomes a sticky issue. Although electronic mail was not used by the researchers involved, if it had been the medium of exchange, the potential legal ramifications would become even more unique than they are in the present system.

Information overload, system security, and legal concerns are some of the potential negative implications involved with using electronic mail, and they raise many unanswered questions. They need to be studied, considered, perhaps monitored and regulated if potential abuses threaten the users.

### **A Critical Analysis of the Present Status and Future Utilization of Electronic Mail**

Although this paper only included the more significant positive aspects and the most problematic negative issues of using electronic mail, other positive and negative concerns have been discussed in the professional literature. However, in terms of cost-benefits analysis, as far as this author is concerned, the scale is tipped strongly on the side of the positive benefits. Enough research exists to suggest that electronic mail is a useful tool for increasing productivity. Certainly, electronic mail is widely enough dispersed that it is no longer considered a "cutting edge" technology. Instead, it is an emerging, growing computer-assisted information system, creating new markets for information and new products to serve those market needs. Its value to both academe and business cannot be denied. Its application, although probably in the infancy stage, is advancing the cause of computer literacy. The argument that suggests a dichotomy will exist between the informationally rich and poor society is a strong and a serious concern for those who fear that our society, subject to a conservative political environment, is already being stratified into two classes. This does not, however, negate the value promised by the new technology. Granted, it would be naive to assume that everyone who wanted computer-literacy could gain it. However, it would be equally naive to ignore that there are a number of incentives presently available to help the new business venture or school gain the technology they cannot afford. For example, Control Data is helping new business ventures with a number of support services provided in low-cost rental suites in several healthy markets.<sup>39</sup> In addition, a number of states provide tax credit for individuals or businesses that donate computer hardware and software to public schools, universities, and vocational schools.<sup>40</sup>

As Ruth Davis argued in defense of electronic mail, the utility of the electronic mail systems is illustrated by the estimates that more than fifty percent of the information transmitted by telephone does not require interactive

communication, and as much as fifty percent of a manager's time is spent communicating with others by telephone, in meetings or by written correspondence. Davis concludes, therefore, that electronic mail systems promise a mechanism for improving productivity and relieving common forms of "office stress."<sup>41</sup> R.J. Spinrad concurs and personally testifies that for those who have had a few years to work with what is a seemingly impersonal system have found that they tend, paradoxically, to break down the barriers to communication. Spinrad further addresses the relevant communication issues squarely when he argues that daily message traffic takes on a less formal, more conversational air, and priorities are easier to establish. But most importantly, Spinrad concludes, immediacy reduces the chances for misunderstanding.<sup>43</sup>

In sum, electronic mail is a rich, exciting resource that can enrich the life and work of those in academe and business. New user's, scholars or business managers, possess the potential to have their lives changed drastically through the new medium. R.J. Spinrad expressed it best in the following lines:

...the most profound effects will probably occur at the personal level, in the way we do things using these systems. Certainly, we will gain new power—radically increased speed and flexibility in manipulating the substance of our working lives. But, more important, we will have found a new medium for interacting with others. Because of this, these systems will have the power to draw us closer together and change the ways we work and live.<sup>43</sup>

No doubt, Lee Jones and Chris Brown would agree.

## Notes

<sup>1</sup>Stephen Connell and Ian A. Galbraith, **Electronic Mail: A Revolution in Business Communications** (London: Knowledge Industry Publications, Inc., 1980), p.3.

<sup>2</sup>Susen S. Kay, "How to Choose Electronic Mail," **Infosystems**, June 6, 1984, pp.98-100.

<sup>3</sup>**Christian Science Monitor**, January 19, 1982, p.11.

<sup>4</sup>Ibid.

<sup>5</sup>Joe Malone, "Use of Personal Computer to Provide Electronic Mail Gaining Acceptance," **Communication News**, September, 1982, p.19.

<sup>6</sup>Kay, Ibid.

<sup>7</sup>Ibid.

<sup>8</sup>Ibid.

<sup>9</sup>Ibid.

<sup>10</sup>Elaine B. Kerr and Starr Roxanne Hiltz, **Computer-Mediated Communication Systems: Status and Evaluation** (New York: Academic Press, 1982), pp. 89-158.

<sup>11</sup>Starr Roxanne Hiltz and Murray Turoff, **The Network Nation-Human Communication Via Computer** (Reading, Massachusetts: Addison-Wesley Publishing Company, Inc., 1978), pp.7-30.

<sup>12</sup>R.E. Rice and D. Case. "Electronic Message Systems in the University: A Description of Use and Utility," **Journal of Communication**, 1983, pp. 131-152.

<sup>13</sup>Kerr and Hiltz, Ibid., p.12.

<sup>14</sup>Allen Newell and Robert Sproull, "Computer Networks: Prospects for Scientists," **Science**, February, 1982, pp.843-851.

<sup>15</sup>C.N. Quinn and H. Jehan, J.A. Levin and S.D. Black, "Real Education in Non-Real Times: The Use of Electronic Message Systems for Instruction," **Instructional Science**, 1983, pp.313-327.

<sup>16</sup>It should be noted that the Ohio State Engineering Department is in the process of setting up an electronic mail system that may be able to send messages, diagrams and other documents between faculty members as well as between students and faculty.

<sup>17</sup>Kerr and Hiltz, *Ibid.* p.12.

<sup>18</sup>*Ibid.*

<sup>19</sup>Jeff Blyskal, "Hello Central, Give Me the Computer," **Forbes**, July 2, 1984, pp.94-95.

<sup>20</sup>Brian Ibsen, "Electronic Mail: A Building Block for the Future Office," **The Office**, August, 1982, pp.19-20.

<sup>21</sup>Stewart L. Tubbs and Sylvia Moss, **Human Communication**, Third Edition (New York: Random House, 1980, pp.12-13.

<sup>22</sup>*Ibid.*

<sup>23</sup>C. David Mortensen, **Communication: The Study of Human Interaction**, (New York: McGraw Hill Book Company, 1972), p.14.

<sup>24</sup>Kerr and Hiltz, *Ibid.*

<sup>25</sup>*Ibid.* p.24.

<sup>26</sup>*Ibid.* p.112.

<sup>27</sup>Gerald M. Goldhaber, **Organizational Communication**, Third Edition (Dubuque, Iowa: William C. Brown Company, 1983), p.141.

<sup>28</sup>Cornelius H. Sullivan, Jr., "Electronic Mail Can Serve as the Delivery Vehicle for Information Intensive Products and Process," **Infosystems**, September, 1983, p.113.

<sup>29</sup>Kerr and Hiltz, pp.90-120.

<sup>30</sup>William J. Cook, **The Joy of Computer Communication** (New York: A Dell Trade Paperback, 1984).

<sup>31</sup>*Ibid.* pp.157-162.

<sup>32</sup>Kerr and Hiltz, pp. 97-98.

<sup>33</sup>Stewart and Tubbs, p.307

<sup>34</sup>*Ibid.*

<sup>35</sup>For example, in Minneapolis, Minnesota, as well as in several other markets in the midwest, Control Data has purchased office buildings that they will rent to new business ventures. The suites share a common reception area, a typing pool and many other support services included in the low monthly rental fee.

<sup>36</sup>James A. Schweitzer, **Protecting Information in the Electronic Workplace: A Guide for Managers**, (Reston, Virginia: Reston Publishing Company, 1983).

<sup>37</sup>Ibid., p.117.

<sup>38</sup>Carlton Rochell, "The Knowledge Business: Economic Issues of Access to Bibliographic Information," **College and Research Libraries**, January, 1985, pp.5-12.

<sup>39</sup>See footnote 35.

<sup>40</sup>For example, **Indiana 1984 Individual Income Tax Booklet** on p.21 has the computer donation credit noted.

<sup>41</sup>Ruth M. Davis, "Computers and Electronics for Individual Services," **Science**, February 12, 1985, p.885.

<sup>42</sup>R.J.Spinrad, "Office Automation," **Science**, February 12, 1985, p.812.

<sup>43</sup>Ibid., pp.812-13.

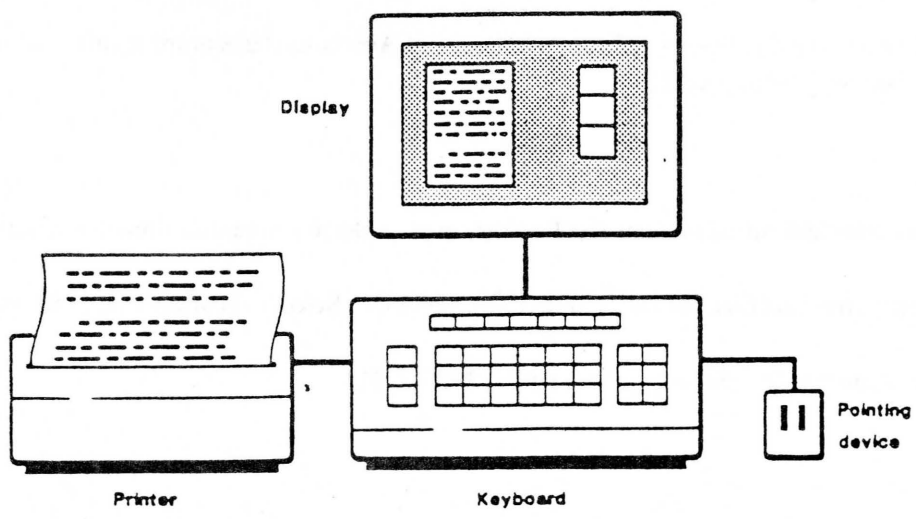


Fig. 1. The electronic desk includes a keyboard, display screen, pointing device, and printer.

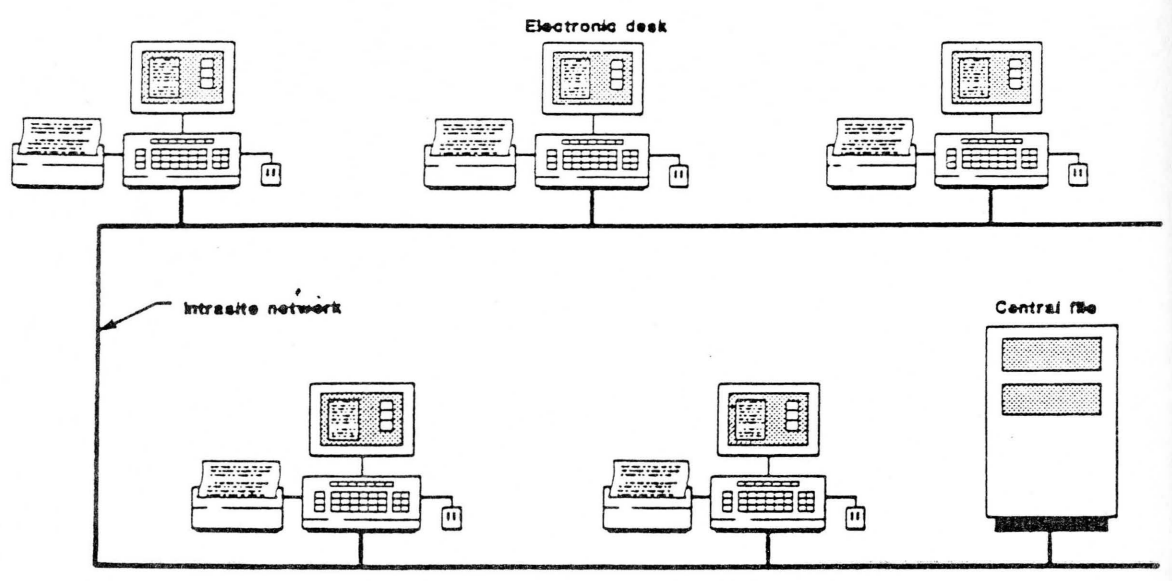


Fig. 2. The intrasite network links many electronic desks to one another and to a central file.



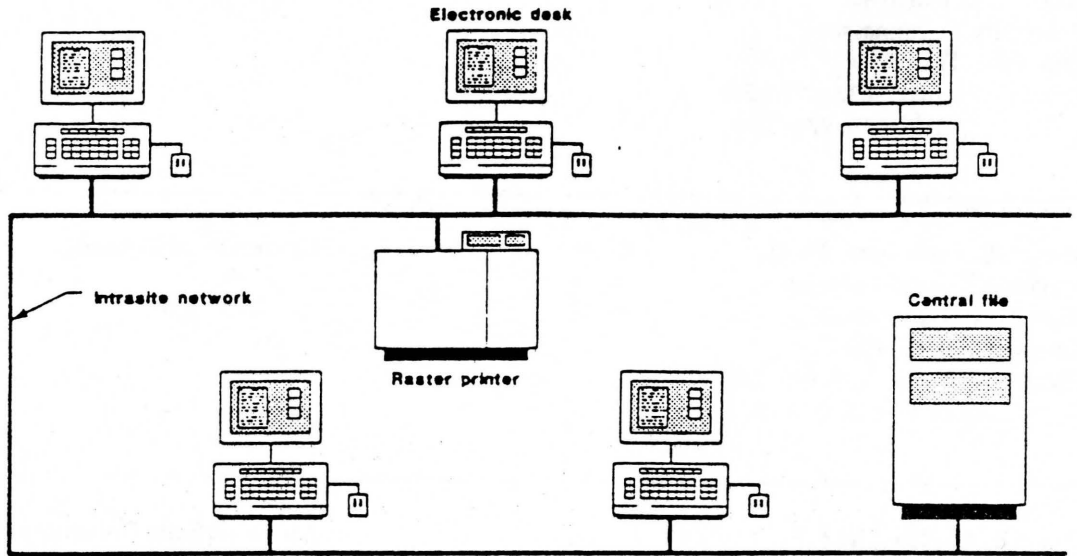


Fig. 3. The expanded intrasite network offers many shared services including raster printing.

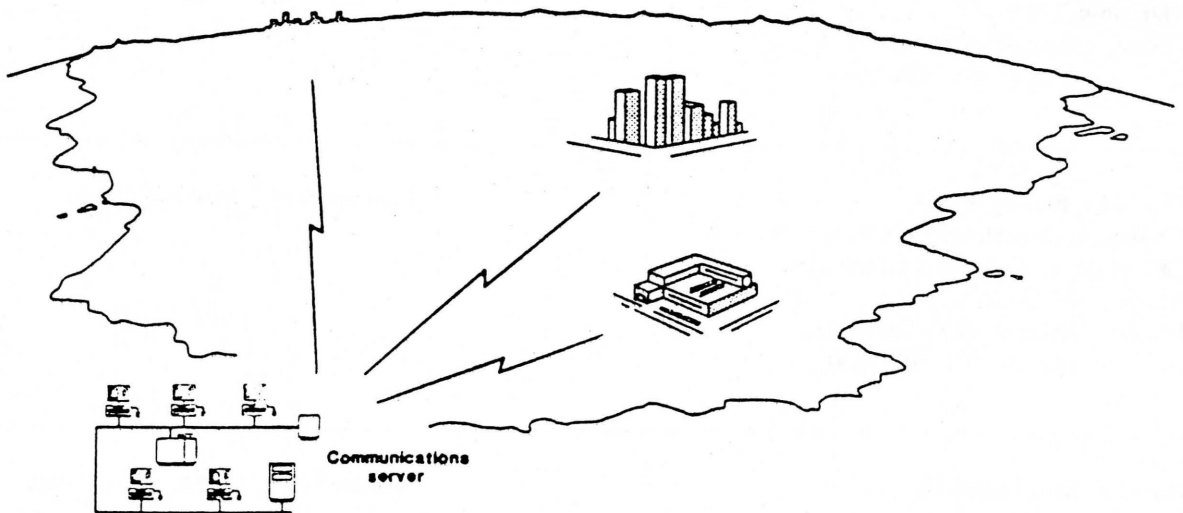


Fig. 4. The communications server enables geographically dispersed networks to be linked together via common carrier networks.